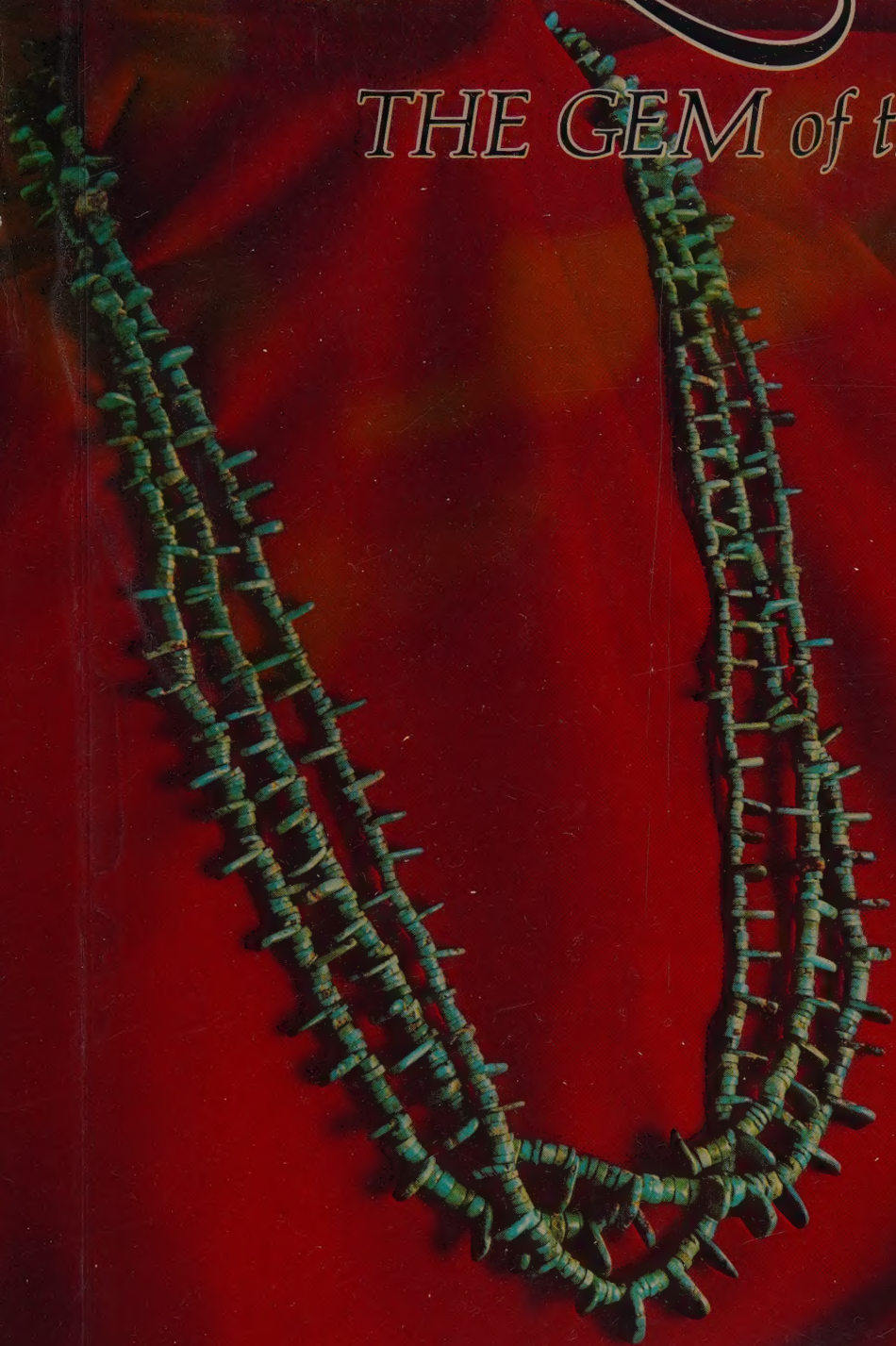
TURQUOISE

THE GEM of the CENTURIES



OSCAR T. BRANSON

$7.95

FIRST EDITION
SECOND PRINTING

This prehistoric Hohokam turquoise necklace was found in the Santa Rita Mountains near Tucson, Arizona in 1965 by Tani Bahti and presented to the Arizona State Museum in Tucson. It is composed of almost 1500 beads and pendants evidently collected from many different localities and was made about 1100 A.D. The mosaic covered shell of the prehistoric Mogollon culture was found in Kinishba Ruin and dates from about 1300 A.D. The red centerpiece is spondylus shell. The pair of light blue turquoise earrings with red spondylus shell centers are of the prehistoric Anasazi culture. They were made about 1200 A.D. and found in Nitsie Canyon.

TURQUOISE

THE GEM of the CENTURIES

by
OSCAR T. BRANSON

Design, Color Coordination and Jewelry Arrangements
by
ETHEL BRANSON

Treasure Chest Publications Inc. P.O. Box 2659, Santa Fe, New Mexico 87501

Photography
by
NAURICE KOONCE
Tucson, Arizona

Printed in Phoenix, Arizona by the Dandick Company and Associated Lithographers

PUEBLO TURQUOISE BEAD MAKER

This painting by Gene Boyce Guest of Santa Fe, New Mexico, is of a bead maker using the old style pump drill. The turquoise in the necklace that is draped over the painting comes from many localities. The years of wear and gentle magic of skin oils have perfected the patina of the combination of gorgeous colors.

GENE BOYCE GUEST

INTRODUCTION

There is a haunting fascination to turquoise, a feeling that takes hold of a person who comes in contact with it for a time. This fascination has been the same down through the centuries and its popularity has spread through many countries of the world. The Egyptians some 70 centuries ago were captivated by it. The evidence is a bracelet of carved turquoise and gold found on the mummified arm of an Egyptian queen. This is the oldest known example of jewelry and was made over seven thousand years ago. For the next several thousand years the Pharaohs sent expeditions of hundreds of men into the Sinai Desert to mine this coveted stone. It was used in almost every decorative way imaginable from beads in jewelry to the lavish decoration of sarcophagi. The Egyptian tombs with their hoards of gold were too great a temptation to looters and thieves and consequently there is pitifully little left for us to see.

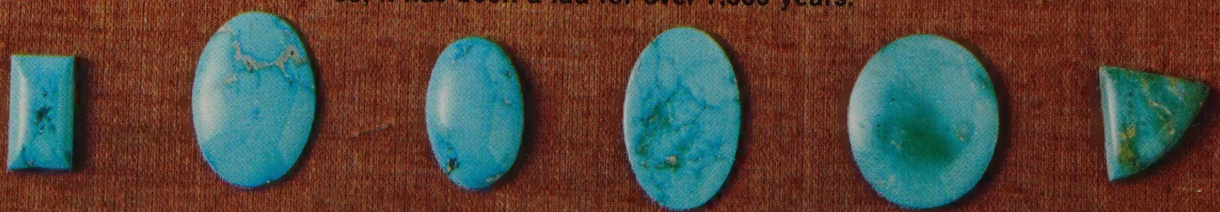
In Persia the earliest mention of turquoise is in a story about the mine of Isaac, the father of Israel, who lived about 2,100 B.C. Turquoise has been mined in Persia since before that time. It was used as lavishly in Persia as it was in Egypt. Persian writings tell of large vases carved from huge pieces of turquoise. One of the largest had the capacity of six gallons.

The origin of the use of turquoise in Tibet is thought to be very early as the Tibetan word for it is original and not borrowed from another language, as it has been in most languages. Practically everyone in Tibet has a love for turquoise, in fact this fascination almost amounts to a mania.

In China turquoise was used in very early times and much has always been worn in jewelry. Large quantities were made into beads and traded into Mongolia, Tibet and other countries. This is also done today. Due to the occurrence in China of large pieces of turquoise of carving quality, the stone gained an ornamental status. Many carvings of large size are known and some are still being made. The Chinese are greatly fascinated by turquoise, and to them it is second only to jade.

In our own Southwest, turquoise mines were worked by Indians before the time of Christ. In fact many of the mines that are producing today were worked in prehistoric times. Here in America today thousands of people are becoming aware of it and the old fascination is taking hold. Down through the ages and especially now, fine gems and jewelry have been a commodity more stable than money. In other words it is and always has been a good investment. Turquoise and silver jewelry is a pleasure to wear and enjoy. While one is enjoying it, they are aware that it is something of value both intrinsic and esthetic.

Some people think turquoise is a fad. If this is so, it has been a fad for over 7,000 years.



These 29 stones are all from The Blue Gem Mine near Battle Mountain, Nevada. They show the color variations from deep blue, through the light blues, to the deep greens. Stones of these color varieties, and many more, come from a single mine. In many cases, stones from one mine resemble very closely those from another mine, and in some cases, it is virtually impossible for an expert, or a lapidary, to tell the difference. The stones above are all approximately the same hardness with very little porosity, and will not change color by absorbing oil and grease. Usually, however, stones of a lighter color have a tendency to be softer and more porous, and will change color with wear.

THE COLOR OF TURQUOISE

Many years ago, someone wrote that robin's egg blue was the ideal color for turquoise. He apparently did not observe that robin's eggs were definitely on the gray-green side of blue. Most European, Persian, and American turquoise authorities agree that the ideal color is called "Royal Blue" (not especially from the "Royal Blue" Mine). "It's the brightest of all shades... the most vivid and intense. Some mines, even good mines, may never produce a single carat of it. Other mines may yield only a few ounces of it in thousands of pounds of normally high-grade material. But wherever it is found... in whichever mine from Nevada to the Sinai Peninsula... royal blue turquoise is always identical, and there is no finer in the world. Aside from this, the color of turquoise is largely a matter of personal choice."* The wedge-shaped stone in the bracelet on page 17 comes the closest to "Royal Blue" pictured in this book.

Robin wood carving
by Art Stadler
Wickenburg, Arizona.

Nest and eggs
Courtesy of
The Department of
Biological Sciences
University of Arizona

*Quotation by Lee Hand from "Sovereigns of the Sage," copyright, 1958 by Nell Murbarger.

PERSIAN TURQUOISE

These stones, from the mines near Mashad, in northern Persia, have been selected to show the many color variations. Most all mines show a great diversity of colors, so one should not say that stones from a certain mine are all one color.

FORMS IN WHICH TURQUOISE IS FOUND

Massive turquoise

Turquoise deposited in cracks in rocks to form vein turquoise.

Turquoise formed in a cavity lined with quartz crystals.

Turquoise formed as nuggets.

Turquoise formed in cracks in rock to form flattened or disc-shaped nuggets.

Vein turquoise, too thin to be cut alone, is called "Saw Rock."

Thin vein turquoise with most of the rock sawed away.

Rough-cut stone with original rock backing.

Stones additionally backed and strengthened with epoxy cement. When the original or mother rock shows through to the face of the stone, it is called "Matrix."

TURQUOISE TAKEN FROM VEINS

Thin pieces of fine turquoise too thin to be cut alone are backed with an epoxy cement mixture which strengthens the stone and makes it much less likely to break.

Stone cut with epoxy backing which is now strong and durable.

Natural Villa Grove nugget

Kingman nugget with matrix colored by shoe dye

STONES WITH ARTIFICIALLY STAINED MATRIX

A natural Fox Mine nugget with light color matrix showing in the fissures

Same type nugget with matrix colored by shoe dye

Natural

Dyed matrix

Natural

Dyed matrix

Stone with craze cracks showing penetration of shoe dye.

ACTUAL TURQUOISE CRYSTALS

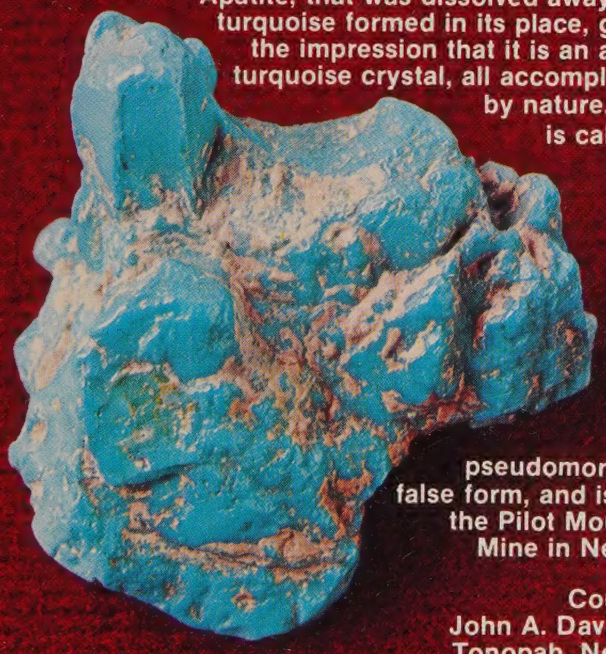
These highly magnified crystals, really less than one 100th of an inch long, proved turquoise to be of the triclinic crystal system. These very rare crystals

were found in Campbell county, Virginia.

Courtesy Neil Yedlin, New Haven, Conn.

PSEUDO TURQUOISE CRYSTAL

This is not a true turquoise crystal but a cast of another crystal, possibly Apatite, that was dissolved away, and turquoise formed in its place, giving the impression that it is an actual turquoise crystal, all accomplished by nature. This is called a



pseudomorph, or false form, and is from the Pilot Mountain Mine in Nevada.

Courtesy John A. Davidson, Tonopah, Nevada.

DENDRITES IN TURQUOISE

The black fern-like figures in this stone from the Pilot Mountain Mine in Nevada are manganese oxide crystals formed at the time the turquoise was being formed. Very rare.

Courtesy Robert G. Smith, Manassa, Colorado.

"FOSSIL" TURQUOISE NECKLACE

Turquoise is a mineral that is deposited by water solutions. "Fossil" means the actual remains of plants or animals preserved in the rocks of the earth's crust. In the necklace above, turquoise has taken the shape of the cavities left when the stems and parts of fossil plants were dissolved out of a harder rock or matrix and turquoise left in its place. Therefore, the turquoise casts should not be called "Fossils."

Courtesy of Tanner's Indian Arts, Gallup, New Mexico.

SPIDER WEB TURQUOISE

Spider web is made up of small nuggets cemented together with natural rock or matrix.

When cut through, the aggregate mass of nuggets resembles spider web.

SPIDER WEB STONES FROM EIGHT DIFFERENT MINES

Most mines produce some spider web turquoise although there are a few that produce practically all spider web of varying qualities. Courtesy Jim Godber, Scottsdale, Arizona.

INCLUSIONS AND FILLINGS

Stones with natural pyrite.

Stones with natural, unfilled surface cavities.

Cavities filled with metal-loaded epoxy.

STONES RESEMBLING TURQUOISE

These and many other kinds of minerals are frequently mistaken for, and sometimes sold as turquoise.

DISCOLORED STONES

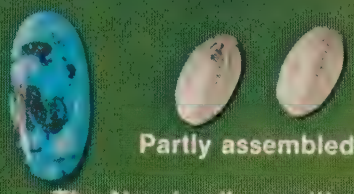
In each of these bracelets and the ring the stones were originally the same color. The porous ones were darkened by wear and natural oils. The harder non-porous stones remained unchanged.

These lovely old earrings were originally all the same blue color but they were cut from nuggets with soft porous centers. Years of wear and absorbing skin oils turned the soft centers green.

NAVAJO TECHNIQUE

Completed bracelet

Parts of bracelet all designed around stone



Partly assembled

The Navajo silversmith usually starts with the turquoise stone and designs the article of jewelry around it.

ZUNI TECHNIQUE

The Zuni craftsman most always constructs the silverwork first and then cuts the stones to fit the spaces or "Bezels."

HOPI TECHNIQUE

Hopi jewelry makers work mostly in overlay, a method employing a sheet of silver with cut out designs soldered over another sheet of silver. They place the emphasis of design on the silver rather than on the turquoise.

By
Victor Coochwytewa

A HARMONY OF NAVAJO AND HOPI ARTISTRY AND SKILL

This outstanding bracelet combines the talents of designer-silversmith Preston Monongye and the lapidary art of Lee A. Yazzie. Using a Hopi mask design of turquoise, coral, jet and shell, which is emphasized by a backgound of intricately inlaid mosaic spider web turquoise.

Courtesy Tanners Indian Arts
Gallup, New Mexico.

TREATED OR STABILIZED TURQUOISE

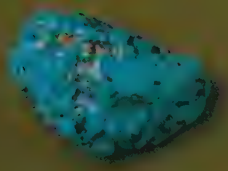
(Synonymous terms)

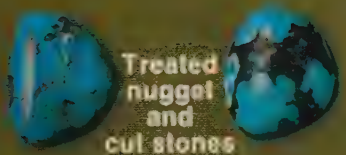
The turquoise illustrated on this page has been soaked and cured in liquid plastic, usually a polyester. It was a light blue, soft, low quality turquoise. Now it is darker blue and much tougher. No color or dye has been added.

Treated-carved bracelet stone

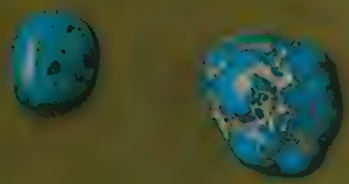
Squash blossom with treated Kingman turquoise has a transparent too-blue look.

Choker made from treated turquoise





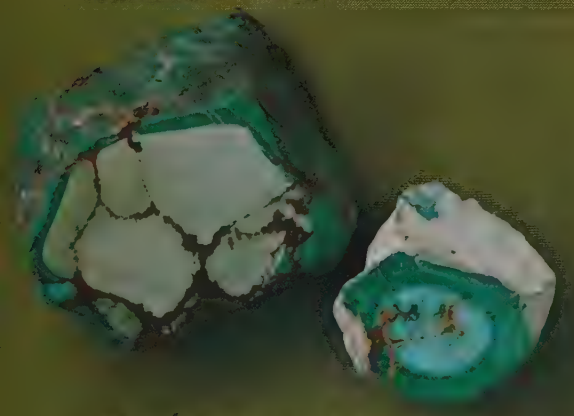
Treated nugget and cut stones

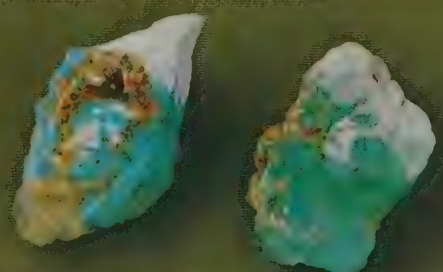


Treated chunk necklace with plastic showing in the fissures and cavities.

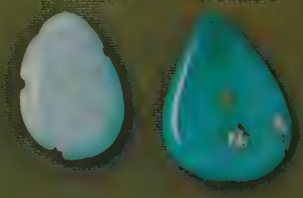
These chunks of turquoise were soaked in plastic to stabilize them. They have been cut and polished showing partial penetration, illustrating the original color in the center and the plasticized outside.

Pieces of soft turquoise were dipped in resin. The tops are the original color, almost white; the lower portion shows the color change the resin causes. If the turquoise is blue, it gets bluer; green, it gets greener.





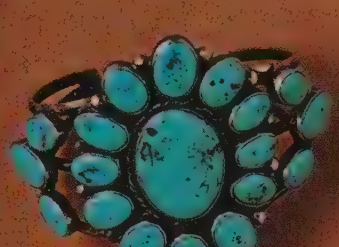
Leadville stones
Natural Treated



Treated turquoise is best recognized by its transparent plastic appearance. It looks unnatural because it looks too blue and too highly polished. Treated turquoise, since it is soft originally, can be easily scratched with a hard knife blade. High quality turquoise cannot be scratched with a knife. For example none of the 36 stones on pages 30 and 31 could be scratched. All of the stones in the picture above were easily scratched. Whereas high quality turquoise cannot be treated or stabilized because the plastic will not penetrate compact dense material. To treat or stabilize turquoise, it is soaked in liquid plastic. The color intenseness is brought about when the plastic penetrates the porous turquoise, making it more transparent. Like wetting part of a colored cloth in water, the wet portion becomes darker in color than the dry. The plastic hardens in the pores of the turquoise, making it more compact and tough but it does not change the hardness. It cannot be harder than the plastic.

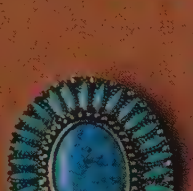
IMITATION TURQUOISE—PLASTIC

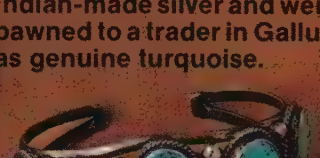
These stones are made of plastic colored with blue mineral pigment.



Plastic sets in cheap factory-made white metal mountings, chrome-plated.

The three largest pieces with plastic sets are mounted in Indian-made silver and were pawned to a trader in Gallup as genuine turquoise.

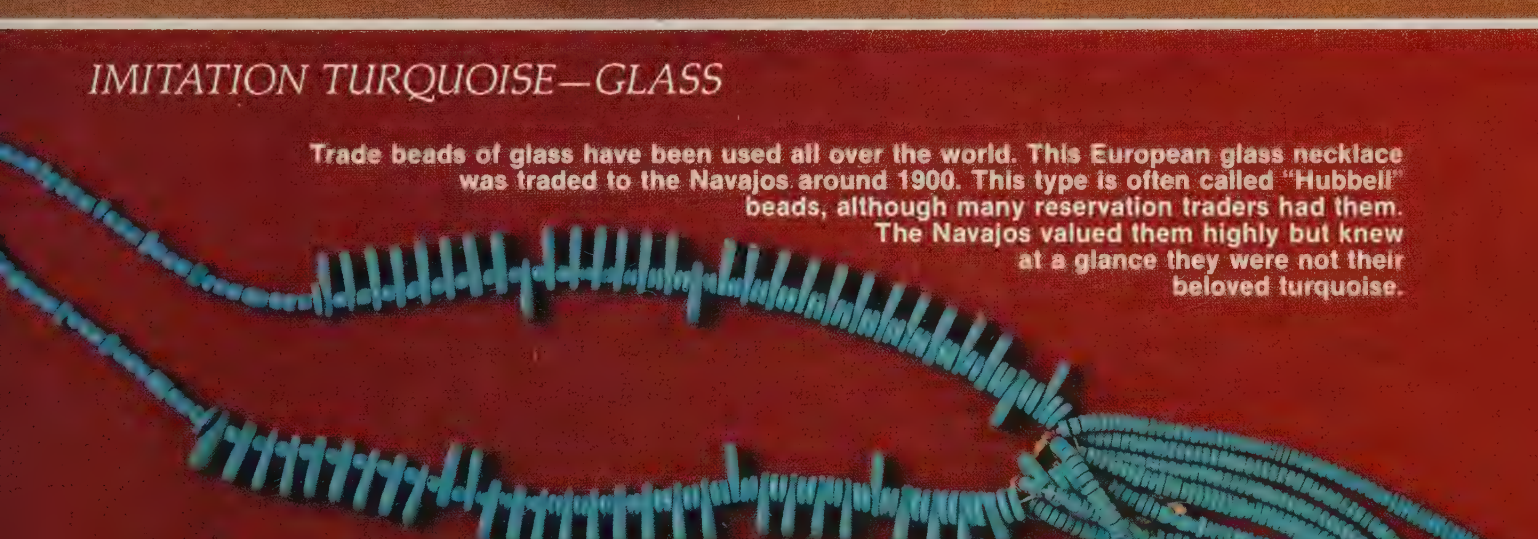




Hong Kong plastic set

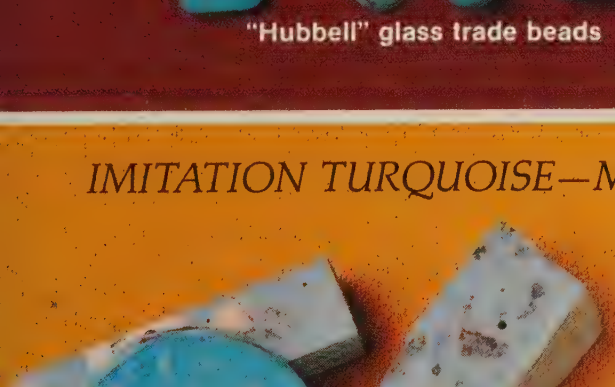
IMITATION TURQUOISE—GLASS

Trade beads of glass have been used all over the world. This European glass necklace was traded to the Navajos around 1900. This type is often called "Hubbell" beads, although many reservation traders had them. The Navajos valued them highly but knew at a glance they were not their beloved turquoise.



"Hubbell" glass trade beads

IMITATION TURQUOISE—MAN-MADE



Mineral-based compositions, usually pressed or molded together, generally with a plastic type binder. Rocks, sand, pyrite, and color are frequently added to imitate matrix. They are soft enough to be easily scratched with a knife blade.

Dyed quartzite

Dyed Howlite

These are stones cut and then dyed

Synthetic turquoise known as "Luroc" is reportedly the same chemical composition as natural turquoise with about the same hardness.

THE NAVAJO JACLA

The literal translation of Jacla or Jaclah from Navajo is "Ear String."

The origin of the Jacla is very possibly prehistoric. The oldest photographs of Navajos show both men and women wearing them in their ears, and also hanging from their necklaces. These disc-shaped turquoise beads have been a very important trade item between the Rio Grande pueblo people and the Navajo since prehistoric times.

A pair of Jacla is made from one long necklace or choker of disc-shaped beads. The beads are restrung, alternating one at a time, onto two separate strings, making a pair of Jacla. The three to five wedged-shaped red spondylus or white shell center beads are added to help make the curve more attractive and add color.

A lovely old Mediterranean coral necklace with a double Jacla worn at the bottom. The top is wrapped with string in the traditional Indian manner. The coral is cut and drilled in Italy, not by the Indians.

Private collection

Persian treated Jacla

All the other turquoise above on these two pages is natural untreated.

Alberta Begay, of Tucson, wearing the traditional Jacla earring.

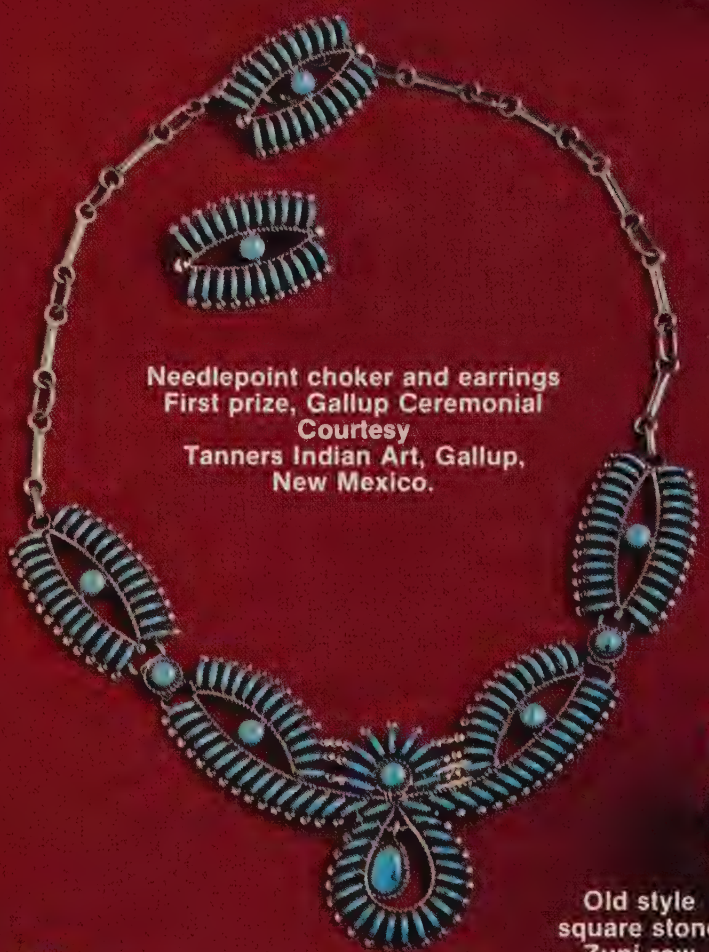
The greatest desire of many Indians is to own a complete, matched Jacla necklace such as this.

Double-Jacla, strung into modern choker with white shell centers.

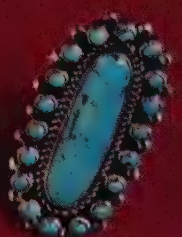
Needlepoint bracelet
Treasure Chest
Santa Fe, New Mexico.

Petit point bracelet
Tanners Indian Arts
Gallup, New Mexico.

Zuni turquoise row bracelet
Private collection



Needlepoint choker and earrings
First prize, Gallup Ceremonial
Courtesy
Tanners Indian Art, Gallup,
New Mexico.



Zuni ring
Treasure Chest
Santa Fe,
New Mexico.

Channel bolo tie and bracelets
Courtesy
Robert and Michelle Winfield
Lone Mountain Turquoise Co.
Vanderwagen, New Mexico.

Old style
square stone
Zuni row
bracelet.

Treasure Chest

Leekya bear fetish bracelet
Private collection

ZUNI CHANNEL WORK NECKLACE

Private collection

The Zuni are masters at creating the most fascinating and beautiful jewelry from bits and pieces of turquoise, as is shown in this variant of the "Squash Blossom" necklace.

CONTEMPORARY TURQUOISE ARTISTRY

Inside of ring

Gems in turquoise designed and executed by Eveli. Born in Algeria, this former student of Charles Loloma has used her talents to create new dimensions for turquoise.

SANTO DOMINGO PUEBLO NECKLACE

Private collection

This large chunk necklace made from Number 8 turquoise weighs almost 2200 carats.

CREATIONS BY CHARLES LOLOMA

Back of Bracelet

The artistry of Hopi master jeweler, Charles Loloma of Hotevilla, Arizona has made a profound impact on the appreciation of contemporary Indian jewelry. This collection of jewelry was made several years ago, and shows a good perspective of the talent possessed by this outstanding person. Each and every piece of his jewelry is different, but one can instantly recognize his creations. Private collection.

FOX MINE

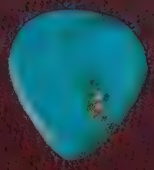
Also known as Cortez Mine

The matrix in this necklace has been dyed.

Private collection

Courtesy Treasure Chest, Santa Fe, New Mexico.

The Fox Mine near Cortez, Nevada was discovered about 1910 or 1912. It has been active since 1915 as one of the greatest turquoise producers of Nevada. It is estimated to have produced over one-half million pounds and is still producing fine turquoise. It has been operated for many years by Mr. Dowell Ward. Turquoise from The White Horse Mine nearby is sometimes sold as Fox.



BLUE GEM MINE

Also known as Blue Gem Lease Mine, Turquoise Tunnel and Contention Mine.

Private collection

The Blue Gem Mine has been noted for the great variety of colors in the turquoise it produces, especially the intense blue to the deep green combinations of colors in a single stone. This has become such a distinguishing feature of Blue Gem turquoise, that similar stones from other mines are often sold as "Blue Gem" turquoise. See Blue Gem stones, page 2.

BLUE GEM MINE

This stone is close to the "Royal Blue" color

Production of the Blue Gem Mine started about 1934, has continued intermittently, and is still producing turquoise. It is part of a major copper deposit being developed by a large corporation. In Nevada there are several Blue Gem Mines, but this one, near Battle Mountain, Nevada has been an important producer of exceptionally good quality turquoise. Since the mine's opening production has been enormous, but no exact information is available. Uninformed persons have mistakenly called this "Battle Mountain" turquoise but there is no "Battle Mountain" mine.

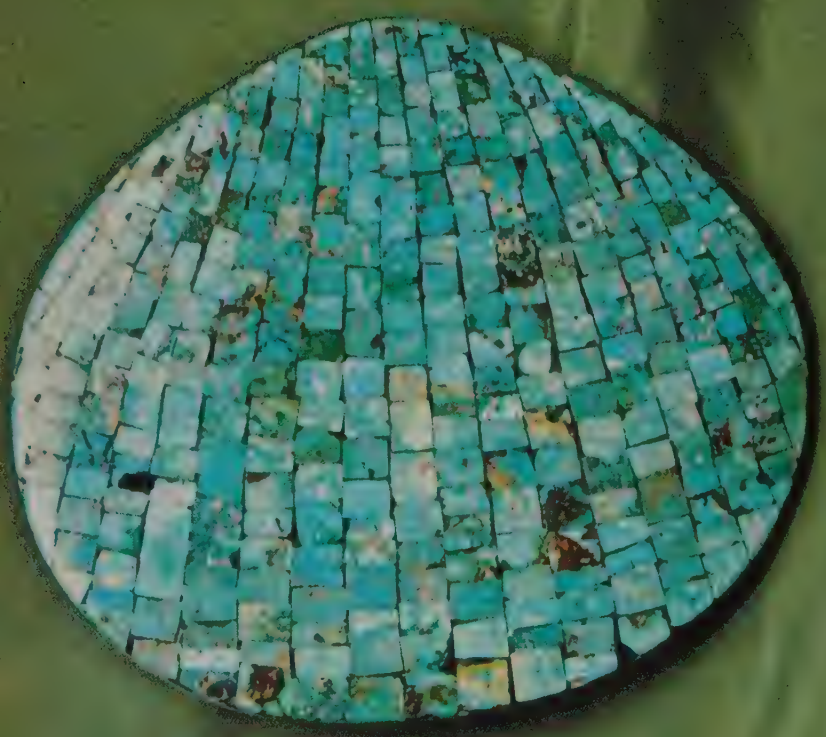
TURQUOISE MOSAICS

A prehistoric mosaic, on a shell base was made by the Hohokam people about 1300 A.D. On display at the Casa Grande National Monument, Coolidge, Arizona. Courtesy National Park Service.

A modern example of the old Hopi earrings overlaid on cottonwood root, worn by ceremonial dancers and said to be a representation of blue corn stacked up.

Zuni pendants on shells, mounted in silver as necklaces.

Old Hopi ring



Mosaic on large pearl shell, sometimes worn in masked dances.

Courtesy The Treasure Chest Santa Fe, New Mexico.

Turquoise mosaics are probably some of the most fascinating examples of jewelry, prehistoric or modern. Ancient man used the small pieces of turquoise to its best advantage, creating a large surface of lovely blue. They understood the value of contrast, and went to great trouble to secure the beautiful red shell of the spondylus, in order to emphasize the bird, animal, reptile and shell forms that were so much a part of their lives.

TURQUOISE MOSAICS

Zuni turquoise overlay necklace on shell, resembling bird form

Santo Domingo mosaic pendant overlaid on red Abalone shell

Modern shield pendant. Turquoise and coral channel inlay in silver.

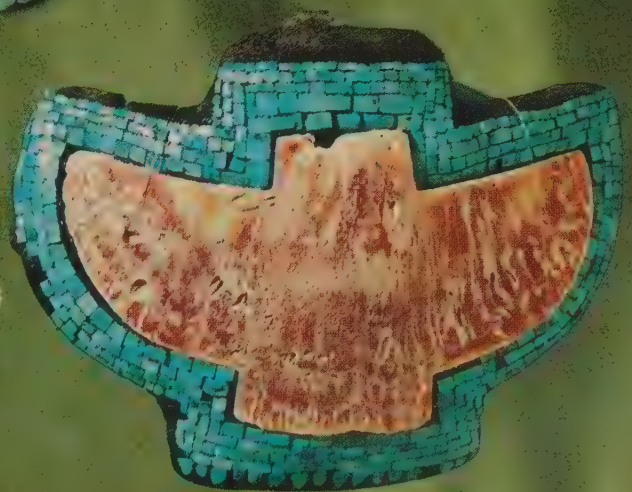
Courtesy Tom Bahti Shop
Tucson, Arizona

Zuni mosaic shell overlay

Silver bracelet and mountain sheep pin, using mosaic panels by Jimmie Herald

Santo Domingo turquoise fragment earrings overlaid on both sides over wooden core

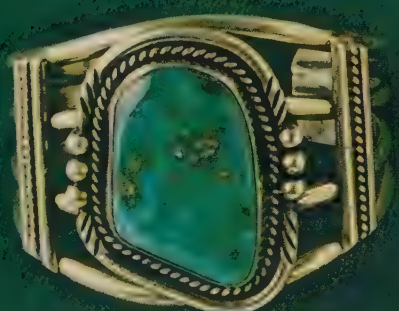
Unique Zuni inlay on a pearl shell. The design of turquoise jet and coral resembles the eagle motif, usually seen on pottery.



This prehistoric mosaic, overlaid on a shell base, was made by the Hohokam people about 1300 A.D. The red-orange center is spondylus shell. It is from the Casa Grande National Monument, Coolidge, Arizona. Courtesy National Park Service.

ROYSTON DISTRICT

Royal Blue Mine, Oscar Wehrend
Bunker Hill



There are many mines in the Royston district producing turquoise, ranging from deep green to deepest blue. The Royal Blue Mine is the main producer.

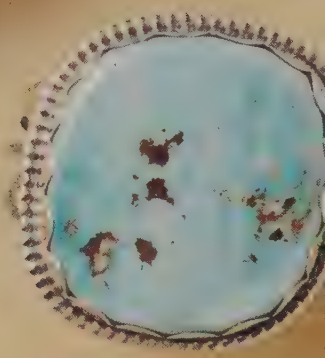
Royston green necklace set
Courtesy The Ed Youngs
Albuquerque, New Mexico

ROYSTON DISTRICT MINES

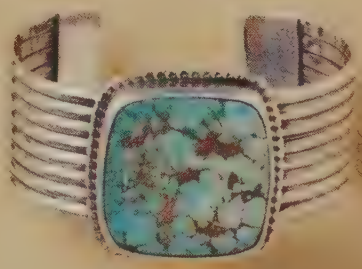
Royal Blue Oscar Wehrend
Bunker Hill

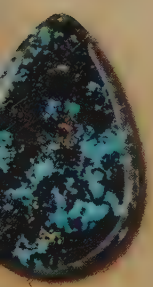
Courtesy Sewell's
Indian Arts,
Scottsdale,
Arizona and Taos,
New Mexico

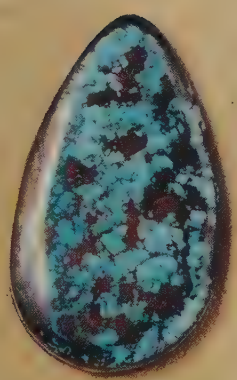
Bracelet stone mined
about 1932 by
Brice Sewell

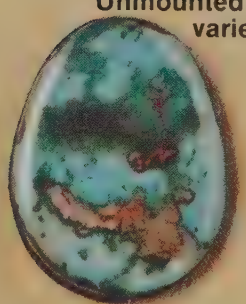


Bracelets and Pendant
Courtesy The Treasure Chest
Santa Fe, New Mexico

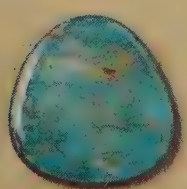


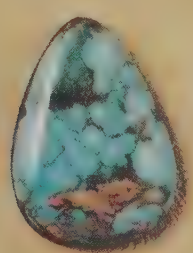


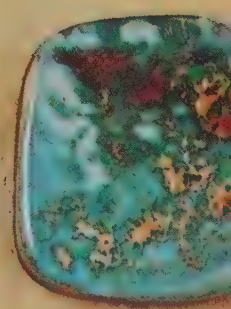




Unmounted Royston Stones, illustrating the great
variety of color and matrix pattern
found in this locality.
Courtesy of Art Rogers
Taos, New Mexico





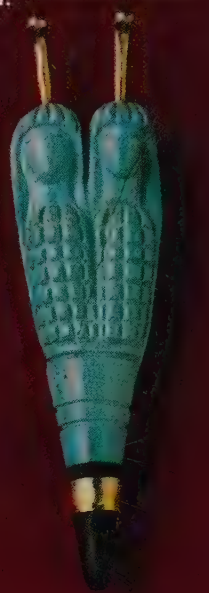


The Royal Blue Mine was discovered in 1902 and has been producing turquoise off and on ever since. It is still a good producer. This was one of the old tunnel mines. With the use of big machinery, it is now largely an open pit operation.

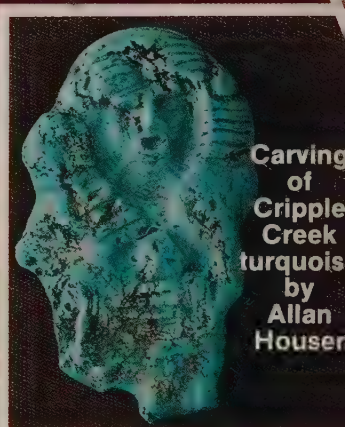
TURQUOISE CARVINGS

A turquoise fetish necklace of the early 1950's representing the work of several Zuni carvers including David Tsikewa and The Sam Delana Family.

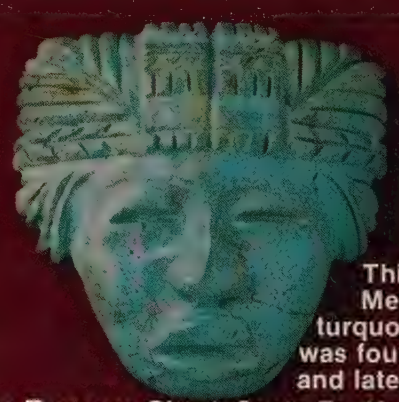
Turquoise carving by Charles Loloma of Hotevilla, Arizona, depicting the blue corn maidens. The turquoise is combined with iron wood and gold. Private collection.



Three fourths natural size

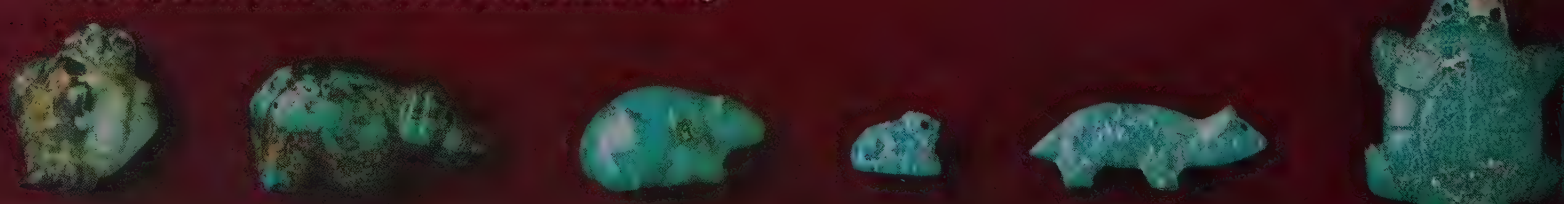


Carving of Cripple Creek turquois by Allan Houser



This old Mexican turquoise mask was found broker and later repaired

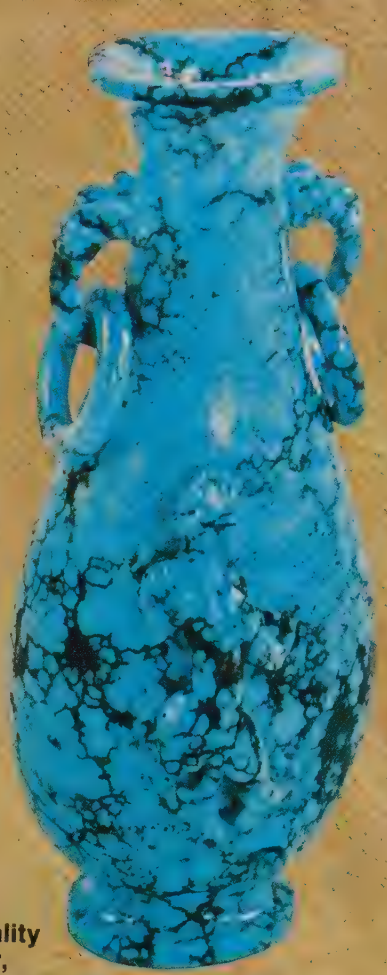
The Treasure Chest, Santa Fe, New Mexico



A row of small Zuni fetishes. These are made for sale or trade rather than ceremonial use.

Courtesy
The Treasure Chest
Santa Fe, New Mexico.

Enlargement of a very old cameo, carved in Greece or Italy, from one piece of material. The background is the original matrix. It was bought in a trading post, mounted in an old Indian silver necklace.



Gem quality Nishapur, Persian turquoise vase. Carved in the Orient. Weight approximately 325 grams.

Courtesy R.H. & Company, Inc.
Los Angeles, California.

Pin courtesy J.C. Zachary, Jr.
Albuquerque, New Mexico.

A Leekya bear fetish with carved necklace and frog of green Blue Gem turquoise contrasted with a pin of deep blue top quality Persian turquoise, mounted in gold.

Necklace courtesy Treasure Chest, Santa Fe, New Mexico.

STORMY MOUNTAIN MINE

The Stormy Mountain Mine near Tenabo, Nevada produces a hard dark blue turquoise flecked with hard black chert matrix. Colors also range into light blues and pleasing greens.

Courtesy Treasure Chest, Santa Fe, New Mexico.

CARICO LAKE MINE

Formerly known as Stone Cabin Mine.

The Carico Lake Mine in Lander county, Nevada is an open-pit operation. Mining is done with large machinery. The colors run from light green to deep blue, all about the same hardness. The matrix is chert or limonite iron, and occurs as nuggets, veins, large nodules and some nuggets with a rough, knobby surface called "Seafoam." Courtesy Carico Lake Mining Company, Albuquerque, New Mexico.

MC GINNIS MINE

Also known as Gem Mine.

The McGinness Mine, about 10 miles from Austin, Nevada, was discovered in 1930. It has not been a large producer, and most of the turquoise was only fair quality.

Most of the stones in the photograph have surface pits and fissures that have been filled

CROW SPRINGS MINE

Also known as Anjax and Bluebird

The Crow Springs Mine near Tonopah, Nevada was discovered about 1909. And worked at intervals ever since. It is not one of the big producers. The colors range from pale to dark in both green and blue. The interesting silver band across a large stone usually indicates the stone has been cracked.

Courtesy J.C. Zachary, Jr., Albuquerque, New Mexico.

LANDER BLUE MINE

Courtesy J.C. Zachary, Jr.
Albuquerque, New Mexico.

The Lander Blue Turquoise Mine, located between Battle Mountain and Tenabo in Lander county, Nevada, has produced some of the most beautiful and unique-type turquoise seen today. In color, it varies from a deep blue to a light blue spider web in a very black contrasting matrix. Some of the turquoise specks are as small as a period on a typewritten page. This is one of the few mines that produced almost nothing but spider web. Mined in only limited quantities, it has become some of the most valued turquoise today. The mine is no longer producing, and it appears that no more rough turquoise will be available without extensive and very expensive exploration.

Courtesy Jerry Egeland, Gallup, New Mexico. Courtesy The Treasure Chest, Santa Fe, New Mexico

RED MOUNTAIN MINE

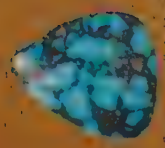
Private collection

A color variety of Red Mountain stones.

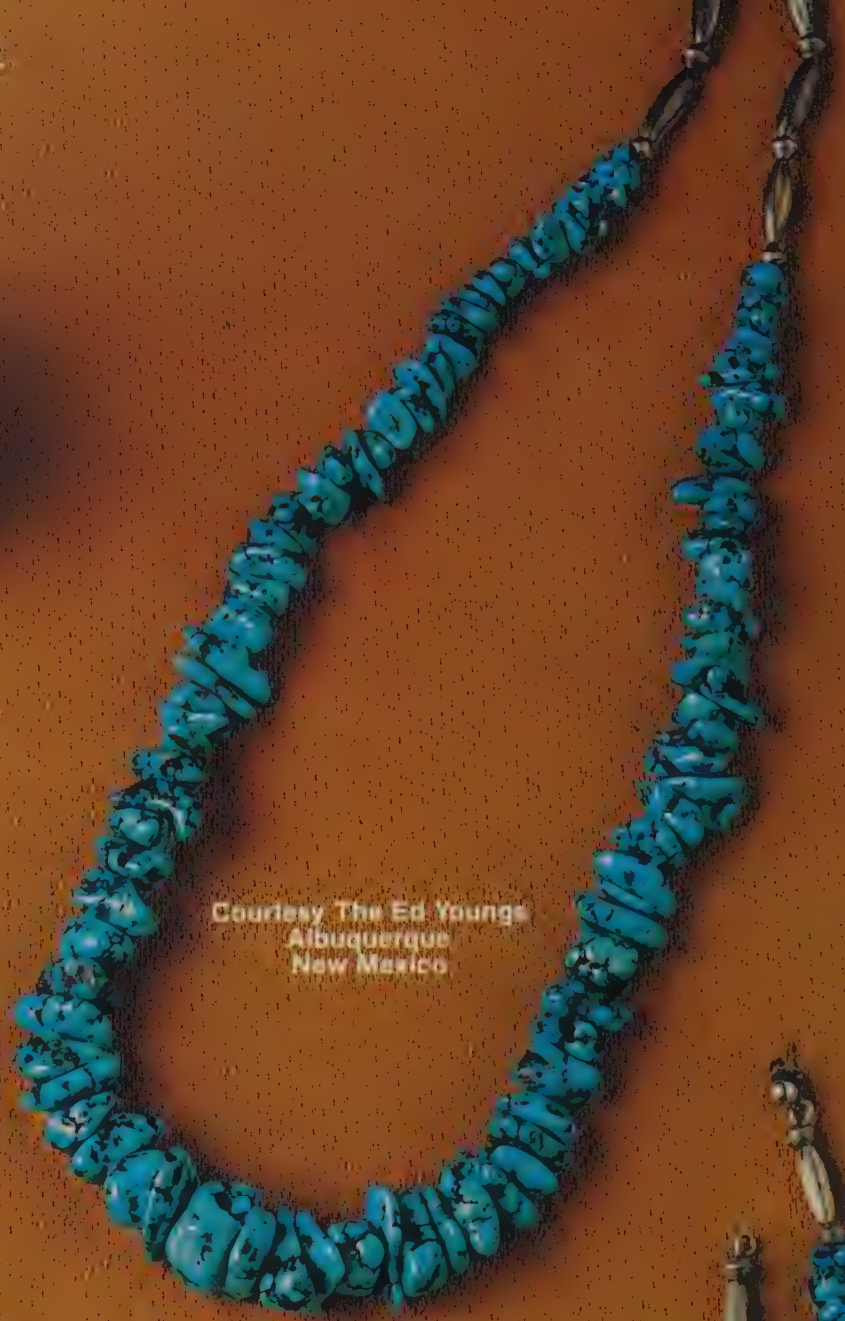
The Red Mountain Mine, near Cortez, Nevada produces some very attractive turquoise. The finest is a very hard compact spider web, with small to large veining. The matrix is red with a black outline. The deep blue is tinted deep green resulting in very striking stones. The mine also produces various blues and greens, from light to dark. The notable characteristic of this stone is the rust-colored veins appearing in the matrix.

GODBER MINE

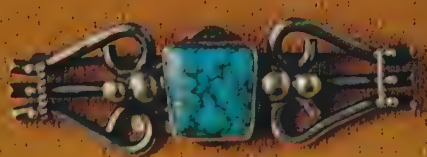
Also known as Dry Creek and Burnham.

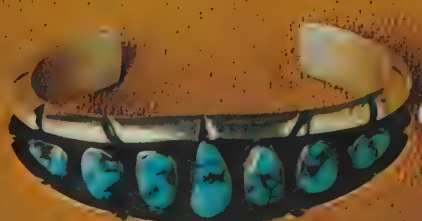


Courtesy Owen's Indian Trading Co.
Santa Fe, New Mexico

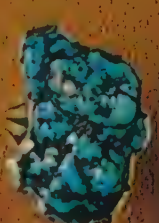


Courtesy The Ed Youngs
Albuquerque
New Mexico





Courtesy Jim Godber, Scottsdale, Arizona



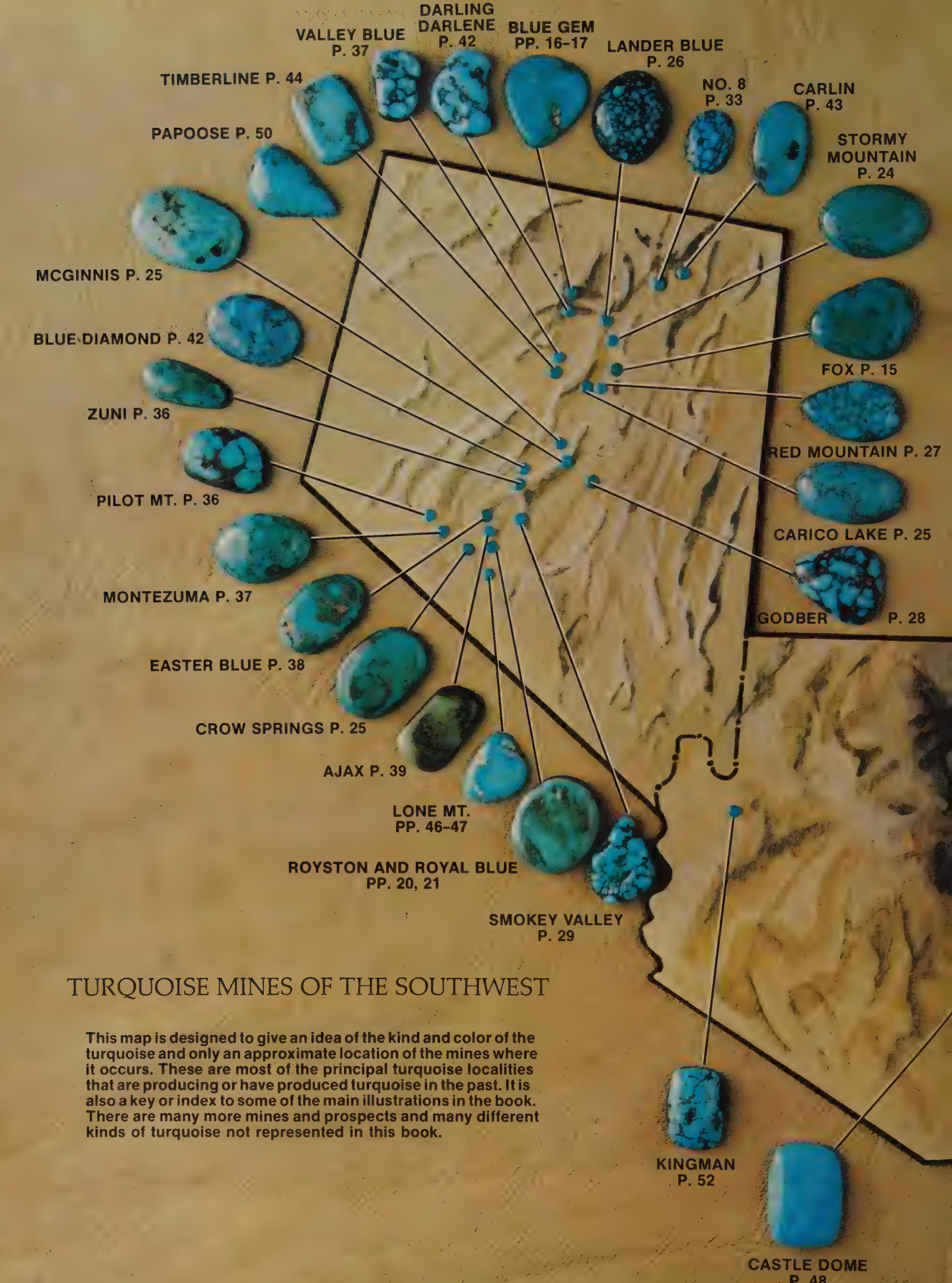
This mine east of Austin, Nevada was discovered in 1932 and has intermittently produced some of the finest turquoise in Nevada. It has been mined by a number of different people, and has had several names, such as Last Chance, Blue Stone, Homesite, Dry Creek, Burnham, and Godber Mines. The Godbers of Scottsdale and Phoenix now own the mine. The turquoise is produced in seams and nuggets, ranging from light to dark blue. The most striking characteristic is a very dark or black matrix forming blotches and veins running through the stone, occasionally forming a beautiful spider web. In some stones, the color is so vividly blue it appears to have been treated, but this turquoise is so hard and compact it would be impossible to treat.

SMOKEY VALLEY MINE

Natural untreated Smokey Valley necklace by Joe & Terry Reano of Santo Domingo, Pueblo, New Mexico.

The Smokey Valley Mine near Tonopah, Nevada is a relatively new mine. The turquoise produced so far is a very attractive light to lovely medium blue. It has a similarity to the turquoise of The Lone Mountain mine. (Two Lone Mountain rings are pictured here to illustrate.)

Courtesy Lone Mountain Turquoise Company, Vanderwagen, New Mexico.



TURQUOISE MINES OF THE SOUTHWEST

This map is designed to give an idea of the kind and color of the turquoise and only an approximate location of the mines where it occurs. These are most of the principal turquoise localities that are producing or have produced turquoise in the past. It is also a key or index to some of the main illustrations in the book. There are many more mines and prospects and many different kinds of turquoise not represented in this book.

Map painted by Gene Boyce Guest, Santa Fe, New Mexico.

BISBEE MINE

Courtesy
The Ed Youngs
Albuquerque, New Mexico.

Courtesy
Art Rogers, Taos,
New Mexico.

Natural untreated
disc bead choker.

Courtesy The Treasure Chest
Santa Fe, New Mexico.

Bisbee turquoise is from a mine near the city of the same name, in the southeastern corner of Arizona. It has long been a by-product of a large copper mine usually coming from a section known as the "Lavendar Pit." The best grades are the deep, intense blue, with slight transparency and a dark reddish-black mottling or veining. The unusual type matrix is very characteristic of this stone, sometimes forming whisps or veils throughout the stone, often called "Smokey Bisbee." There are also many shades from light to dark blue, and light to very attractive dark green. Most Bisbee turquoise is too hard and compact to be treated or stabilized, but there is a quantity of treated Bisbee being sold. The soft-type turquoise takes the plastic well, and looks like the natural when polished.

The Number 8 turquoise mine in Eureka county, north of Carlin, Nevada, was discovered in 1925 and first mined in 1929. At present, the mine is closed and considered depleted. The mine produced some of the largest nuggets of turquoise ever discovered. Almost all the turquoise produced is of the spider web-type, with the matrix varying from golden brown to black. The colors grade from very light blue to very dark blue, some with interesting tints of green. The stones above, all from this mine, display the extreme color variety of Number 8 turquoise. As with most mines, Number 8 turquoise has a certain characteristic color and matrix pattern that is very easily identified. Courtesy Owen's Indian Trading Company, Santa Fe, New Mexico. Frank Patania's Thunderbird Shop, Tucson, Arizona. The Treasure Chest, Santa Fe, New Mexico.

Zuni belt with light blue-green, Number 8 turquoise, courtesy The Treasure Chest, Santa Fe, New Mexico.

The Southwestern Indian, with his love for turquoise, has taken advantage of the possibilities of decoration and has made the belt one of his favorite articles of adornment.

Private collection

Navajo sand cast buckle with Blue Gem turquoise stone.

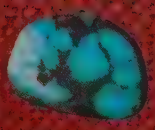
Navajo belt with Number 8 turquoise courtesy Tom Bahti Shop Tucson, Arizona.

Zuni needle point belt with Morenci turquoise. Courtesy The Ed Youngs Albuquerque, New Mexico.

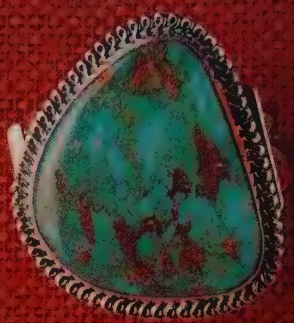
Navajo concho belt with Morenci turquoise.

Navajo "Singer" style belt with turquoise fragment inlay, courtesy Tom Bahti Shop, Tucson, Arizona.

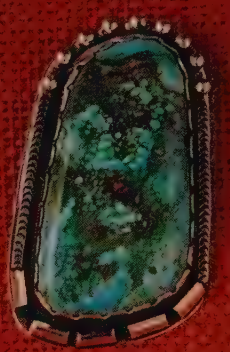
Navajo belt with Persian turquoise.

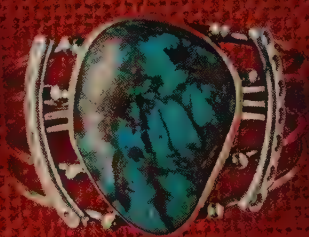


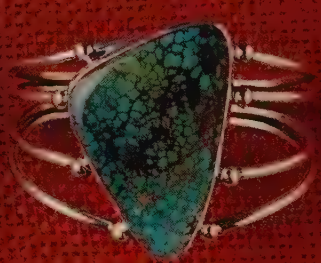
PILOT MOUNTAIN MINE



The Pilot Mountain Mine, east of Mina, Nevada, is one of the newer mines. It is producing quantities of high grade hard turquoise, with extremely interesting and varied matrix patterns of red, brown to black, and a variety of spider web. There is practically every color variation of blue and green, with combinations almost too numerous to imagine.

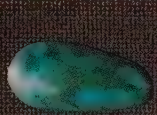






Some Pilot Mountain color varieties.

Art Rogers, Taos, New Mexico. Courtesy Robert G. Smith, Manassa, Colorado.



ZUNI MINE

The Zuni Mine, near The Blue Diamond Mine, south of Austin, Nevada is a small new mine that produced some very attractive deep blue-green turquoise, with a pleasing green overcast or tint. The stones range from light greenish-blue to deep green, and are very charming. Presently it is not being mined.

Courtesy Ron Hammon, Fallon, Nevada.

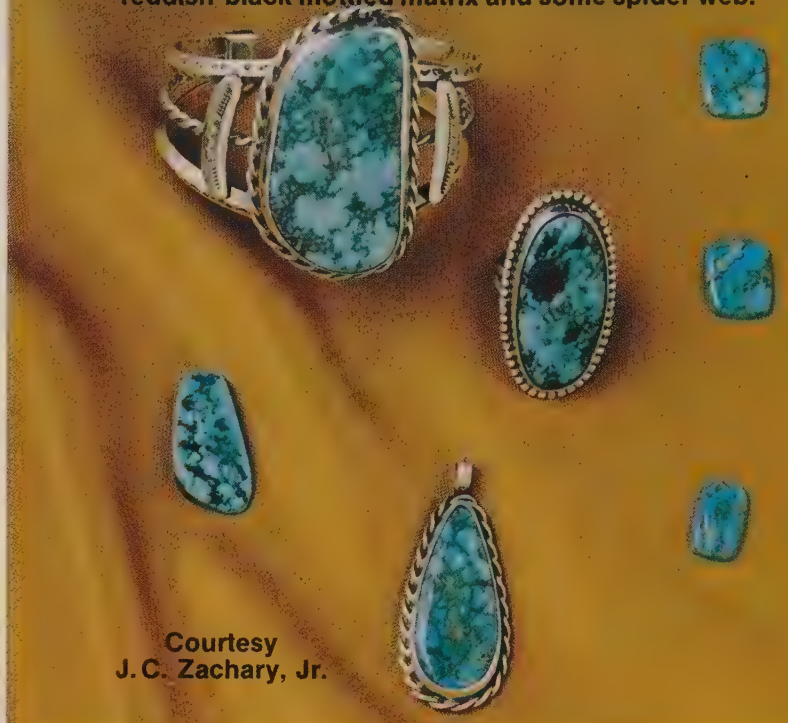
CRIPPLE CREEK MINE

There are several mines or prospects near the town of Cripple Creek, Colorado. Turquoise here has chiefly been a by-product of the gold mining industry. The tailings from the mines are sometimes used to gravel the streets and pieces of turquoise are frequently found after a rain.

Courtesy J. C. Zachary, Jr.
Albuquerque, New Mexico.

VALLEY BLUE

Valley Blue is a small productive mine between Austin and Battle Mountain, Nevada. Some of the stones are a beautiful medium to deep blue. Most are light blue somewhat translucent, with a dark reddish-black mottled matrix and some spider web.



Courtesy
J. C. Zachary, Jr.

LEADVILLE MINE

There are several turquoise mines and prospects near Leadville, Colorado. The production is small and mostly low grade. The high grade stones are quite beautiful, a deep blue with a tint of green. The greater part of the turquoise mined here, even if it

Bracelets courtesy
Mrs. Robert G. Smith
Manassa, Colorado.

has a good color, is honeycombed throughout with holes and cavities containing pieces of crumbly matrix making most of it suitable only for treating.

Courtesy Tobe Turpen,
Gallup, New Mexico.

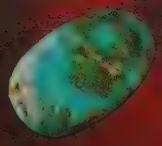
MONTEZUMA MINE

The Montezuma Mine is in Mineral county, south of Mina, Nevada. It is a small mine with limited production. The bulk of the turquoise produced is

Spider web nugget necklace with gold beads.

low grade, but it does produce very fine high grade. Some stones are like the Royal Blue turquoise. A quantity of hard blue-green spider web was produced. The matrix is brown to black, and in the necklace above, the iron oxide used to polish the stones has stained it red.

Courtesy Tanners Indian Arts
Gallup, New Mexico.



EASTER BLUE MINE

Also known as Blue Mountain Mine and Blue Gem Mine — not to be confused with the Blue Gem Mine near Battle Mountain.

The Easter Blue Mine located northwest of Tonopah, Nevada, was discovered in 1907. This mine has not been a large producer and consequently has changed hands many times. The first turquoise found here was an easter blue color; therefore, the name. The turquoise produced recently is similar to that found in the nearby Royston mines, and at Pilot Mountain. Some stones show a very attractive large mottled spider web with light blue centers in the webbing. Many stones are deep blue-green, usually with a light to dark brown matrix.

Courtesy The Ed Youngs, Albuquerque, New Mexico, and The Treasure Chest, Santa Fe, New Mexico.

AJAX MINE

The Ajax Mine is one of the small new mines in the Royston area, north of Tonopah, Nevada. The turquoise produced is mostly light blue, with darker blue veins and blotches with a greenish cast. Some stones show a very predominating dark green with light blue blotches; an interesting turquoise but not especially popular.

Courtesy Clifford Gibson
Bountiful, Colorado.

VILLA GROVE MINE

The mine at Villa Grove, near La Jara, Colorado, is one of the old mines that produced a high percentage of excellent hard blue turquoise. The best is a deep sky-blue to pale blue, with attractive brown to black matrix, some with beautiful spider webbing. Discovered in 1901, it has been mined sporadically until recently, and presently it is not being worked.

Courtesy Tanners Indian Arts
Gallup, New Mexico.

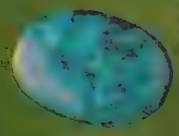
Courtesy Jim Godber
Scottsdale, Arizona.

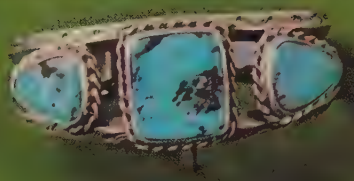
The Pueblo Indians of the Rio Grande Valley have been the principal bead makers to the Indian nation for centuries. Possibly because at nearby Cerrillos they were close to an excellent source of turquoise. The Zuni Indians have also been famous turquoise bead makers and they favor the chunk type necklace because they like to wear great quantities of turquoise. The beads are made by flattening the turquoise fragments on both sides before drilling. Formerly the turquoise was drilled by using the old pump drill. Now most of it is drilled with electric drills frequently using diamond bits, especially for the harder natural turquoise. Treated turquoise is soft and can be drilled with an ordinary drill. After drilling, the rough blanks are strung on a wire and worked round on a flat sandstone slab.

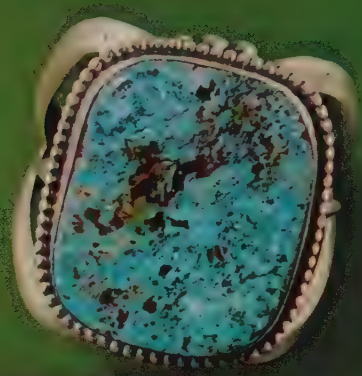
At the present time to make it easier the beads are usually rounded by holding them against a revolving emery wheel on an electric grinder. When perfectly rounded they are polished and strung on a cord to form the finished necklace. Bead making is usually a family affair with the wife doing the drilling and the husband the cutting and polishing. The children, if old enough, do any job they can, like stringing the beads. A strand of beads seldom is the work of one single person. Regardless, it all adds up to a tremendous amount of work. The large round beads are all cut individually and drilled and polished separately as are the chunks and nuggets.

Courtesy Owen's Indian Trading Company, Santa Fe, New Mexico.
Courtesy The Treasure Chest, Santa Fe, New Mexico.

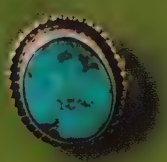
BLUE DIAMOND MINE







Courtesy
The Treasure Chest,
Santa Fe, New Mexico.

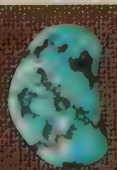


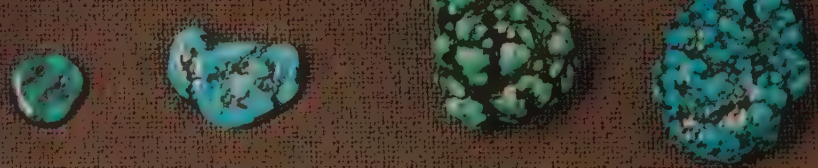
Private
collection

The Blue Diamond Mine, south of Austin, Nevada produces a very hard light to deep blue turquoise, with an attractive swirl or mottled pattern of light and dark blues. It has brown to black matrix resembling a stormy pattern not unlike light and dark clouds being blown about in a blue sky. Unfortunately, the mine is located at a high altitude and cannot be mined in the winter months, due to the extreme cold and snow.

Courtesy Ron Hammon, Fallon, Nevada.

DARLING DARLENE MINE





The Darling Darlene Mine, discovered by Joe Barredo in 1972, and named for a daughter, has produced some exceptionally fine turquoise. It occures in seams and nuggets in very pleasing colors from light to deep blue, and a deep blue green. It is a small two-man operation, and can be worked only in the summer months, so the production is limited.

Courtesy J. C. Zachary, Jr., Albuquerque, New Mexico.

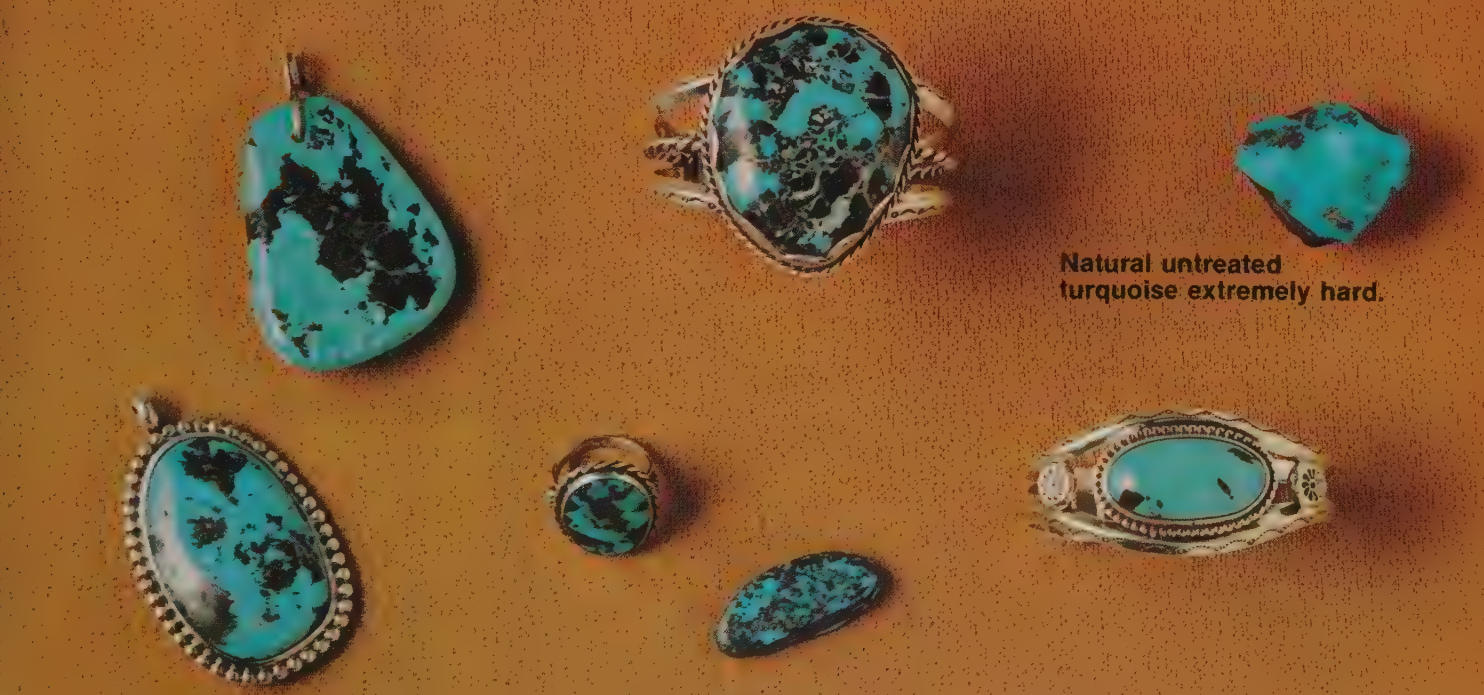
CERRILLOS MINES

Also known as
The Tiffany
and Castillian Mines

Courtesy Sewells Indian
Arts, Taos, New Mexico,
and Scottsdale, Arizona.

The Indians mined turquoise in very extensive workings some 300 years before the first Spaniards settled at nearby Santa Fe, New Mexico. Many individual Indians from the area have mined turquoise here throughout the years. Several commercial mining ventures have produced quantities of fine turquoise. No active mining has been carried out for many years. Recently there has been some very poor grade dark green material produced in the vicinity. The Indians mined large quantities of medium quality soft blue turquoise, principally for bead material. Some larger pieces were made into jewelry. This quality turquoise turns green after a while, sometimes to very pleasing shades if exposed to skin oils. All the above turquoise is known to have come from the Tiffany and Castillian Mines.

CARLIN MINE



Natural untreated
turquoise extremely hard.

The Carlin Mine, sometimes called the Carlin Black Matrix Mine, is located in the very rough mountainous country north of Carlin, Elko county, Nevada. The mine has not operated for many years, but did produce some very striking hard stones of a distinctive blue-green color in a very hard black chert matrix. Some turquoise mined was of such an intense blue color, it is hard to believe it was turquoise.

Courtesy The Treasure Chest
Santa Fe, New Mexico.

"SEA FOAM" TURQUOISE

"Sea Foam" is a descriptive term recently applied to a kind of knobby, foam-looking nugget that can be polished without cutting, except for flattening the back to mount in jewelry. Many mines have produced this type of nugget, but it has not been popular until the new term "Sea Foam" appealed to the buyer.

Courtesy Lone Mountain Turquoise Company
Vanderwagen, New Mexico.

TIMBERLINE MINE

Timberline is a new small mine producing vein and nugget turquoise. The vein material is a light to deep blue, and most of the nuggets are spider web of light to dark veining. An unusual blue-green color seems to be characteristic of the turquoise of this mine.

Courtesy Ron Hammon
Fallon, Nevada.

The King Turquoise Mine near Manassa, Colorado, was one of the many turquoise deposits mined by Indians before the advent of white men. It was rediscovered by I. P. King in 1890 while prospecting for gold. The original name was Lick Skillet, due probably to the poor picking at the time. The mining was carried on intermittently by members of the King family. Up until the present time, tunneling was used to recover the turquoise. Now, Bill King is using an open-pit operation. The turquoise from the King Mine has been popularly called "Manassa Turquoise." One type, "Manassa Green," is an attractive deep green, tinted with blue, and mottled with a golden brown matrix. Colors range from very light blue to deep sky-blue into the bluish-greens and deep greens. A quantity of very attractive spider web with brown-red matrix has been produced. The above row of stones illustrate the wide range of color of the Manassa Turquoise.

Courtesy
Bill King, Manassa, Colorado

LONE MOUNTAIN MINE

The Lone Mountain turquoise mine near Tonopah, Nevada is one of the leading producers of fine turquoise in Nevada. It was discovered by Lee Hand in 1920 and filed under the name of Blue Jay Mining Lode. At first it was called the Blue Jay Mine On Lone Mountain and later just Lone Mountain. As with most mines it was at first a tunnel and shaft project but when Menlow Winfield bought the mine it was made an open pit operation. The turquoise from this mine is mostly good to high grade and usually in the form of nuggets although there is a quantity of vein material. The necklaces shown above are the work of Joe B. Reano of Santo Domingo, Pueblo.

Courtesy of
Robert and Michelle Winfield
of The Lone Mountain Turquoise Company
Vanderwagen, New Mexico.

A very interesting occurrence of turquoise found here is a condition where the turquoise was deposited in cavaties or molds left when parts of fossil plants were dissolved out of a harder rock. It is popularly called "fossil turquoise." (Illustrated on page 5.) The turquoise is graded into golden matrix, black matrix, and spider web. At present, most of it is cut and polished or the nuggets drilled and polished at the mine, and very little rough is sold. The cut stones and jewelry above show the great variety of color found in this mine. The unusual and attractive necklace shown above is the work of Joe Reano of Santo Domingo Pueblo. Courtesy of Robert and Michelle Winfield of the Lone Mountain Turquoise Company, Vanderwagen, New Mexico.

CASTLE DOME MINE

Also Pinto Valley Mine.

Turquoise from the Castle Dome Mine and the Pinto Valley Mine is a by-product of a large copper-mining operation. Formerly, the miners picked up what turquoise they encountered and sold it to dealers and cutters. Now, however, the turquoise is recovered by a person who pays the copper company for the turquoise he recovers and sells it on the open market. Tons of turquoise are obtained by these methods, but only a very small quantity is of high quality. All of the rest, probably 90 percent, is used for treating

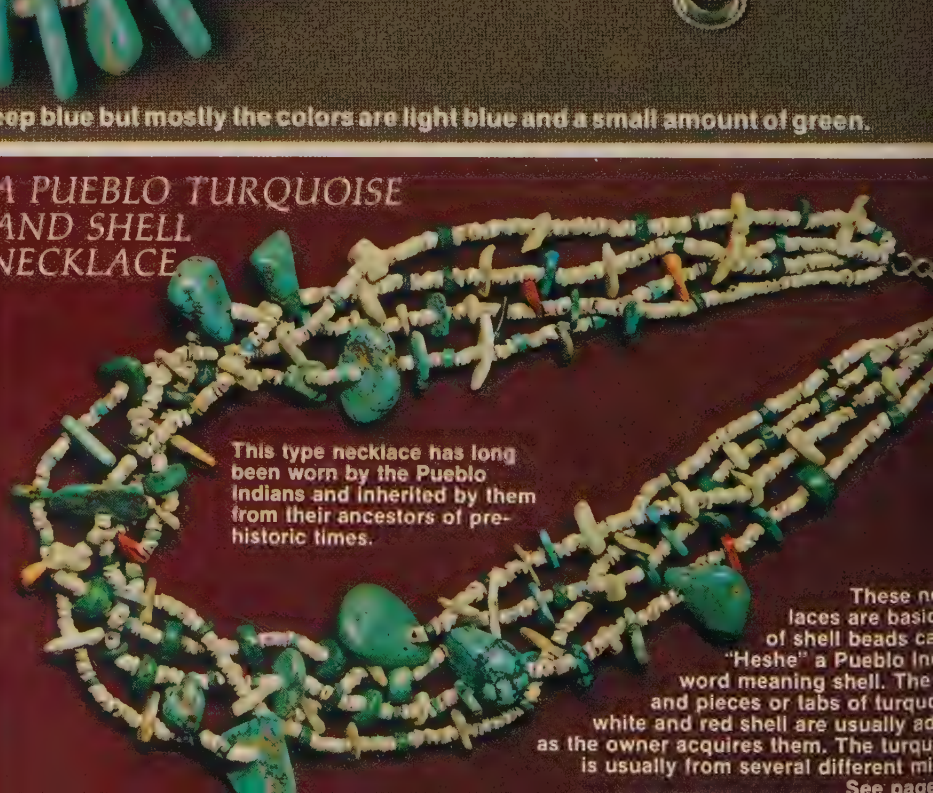
Of the high quality stones found, some are deep blue but mostly the colors are light blue and a small amount of green.

CANDELARIA MINE

The turquoise from the Candelaria mine near Tonopah, Nevada produces a beautiful blue green gem with attractive

light brown matrix. It is found in veins and seams and usually in very thin pieces which must be backed. The brown on this stone is plastic filler. Courtesy George Dyer, Tonopah, Nevada.

A PUEBLO TURQUOISE AND SHELL NECKLACE



This type necklace has long been worn by the Pueblo Indians and inherited by them from their ancestors of pre-historic times.

These n
laces are basic
of shell beads ca
"Heshe" a Pueblo In
word meaning shell. The
and pieces or tabs of turquo
white and red shell are usually ad
as the owner acquires them. The turqu
is usually from several different m

See page

MORENCI MINE

Courtesy
The Treasure Chest
Santa Fe, New Mexico

The mine at Morenci, Arizona, is another of the large copper mines that produces a large quantity of turquoise as a by-product, and which is sold through a franchised dealer. A great amount of beautiful turquoise has been produced by this mine, and it all has a characteristic color—a light to very dark blue, not much green, and very little spider web. The matrix is almost always light tan, and usually with specks of pyrite showing.

PAPOOSE MINE

The Papoose Mine, north of Austin, Nevada, has only been in operation a short time and has produced some very distinctive deep blue gems. The dark brown to black matrix contrasts very nicely with the deep blue and greenish-blue of the stones. Some of the turquoise is slightly honeycombed, leaving holes and pits in the stones, which necessitates the use of a plastic filler. This is one of the mines in Northern Nevada that is not workable in the winter months due to the deep snow. Therefore, the production is limited.

Courtesy
Bill Murphy, Tonopah, Nevada

Courtesy
The Treasure Chest, Santa Fe, New Mexico

TYRONE MINE

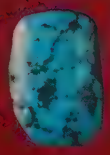
...rs, in the early part of this century, large
...antities of fine turquoise were produced.
...e Azure Mine was supposed to have produced
...re high-grade turquoise than any single deposit on record,
...t that was in 1933. At present, there is very little high-grade
...quoise available, only light blue, soft material as a by-product of
...opper mining operations at this mine west of Silver City,
...w Mexico. Courtesy G. J. Dickerson, Los Cruces, New Mexico

SANTA RITA MINE

This turquoise is the by-product of a large copper mine east of Silver City, New Mexico. The color ranges from pale blue to very deep blue. At present, there is little available.

HACHITA MINES

The Hachita Mines, comprised of the Cameo, Azure, Galilee, and Aztec are a very old group of mines near Hachita, Grant county, New Mexico. Like most occurrences in the Southwest, turquoise was mined here in prehistoric times. The turquoise encountered here is predominantly green. Only a small percentage is of a good blue color. The matrix is light to dark brown with very little black. The stones shown above are a good representation of the colors.
Courtesy G. J. Dickerson, Los Cruces, New Mexico



KINGMAN MINE

Courtesy
The Treasure Chest
Santa Fe, New Mexico

Courtesy
Roger Tsybetsaye
Zuni, New Mexico

Santo Domingo
Pueblo, Necklace

Kingman turquoise comes as a by-product from a large open-pit copper mine in the Mineral Park Mining District, northwest of Kingman, Arizona. It was mined first by Indians many years before the Europeans came to America, and later by a number of individuals and companies. Now franchised miners and dealers sell the turquoise commercially. Although there are quantities of fine deep blue turquoise available, a large percentage of that mined is being treated or stabilized. The colors run from light blue to very dark blue with some tints of green. The matrix is from light brown to black and frequently flecked with pyrite. In the past, some of the medium to good quality stones changed color sometime after being cut. It seems that the good quality being produced now is fairly color stable. Courtesy L.W. Hardy, Kingman, Arizona.

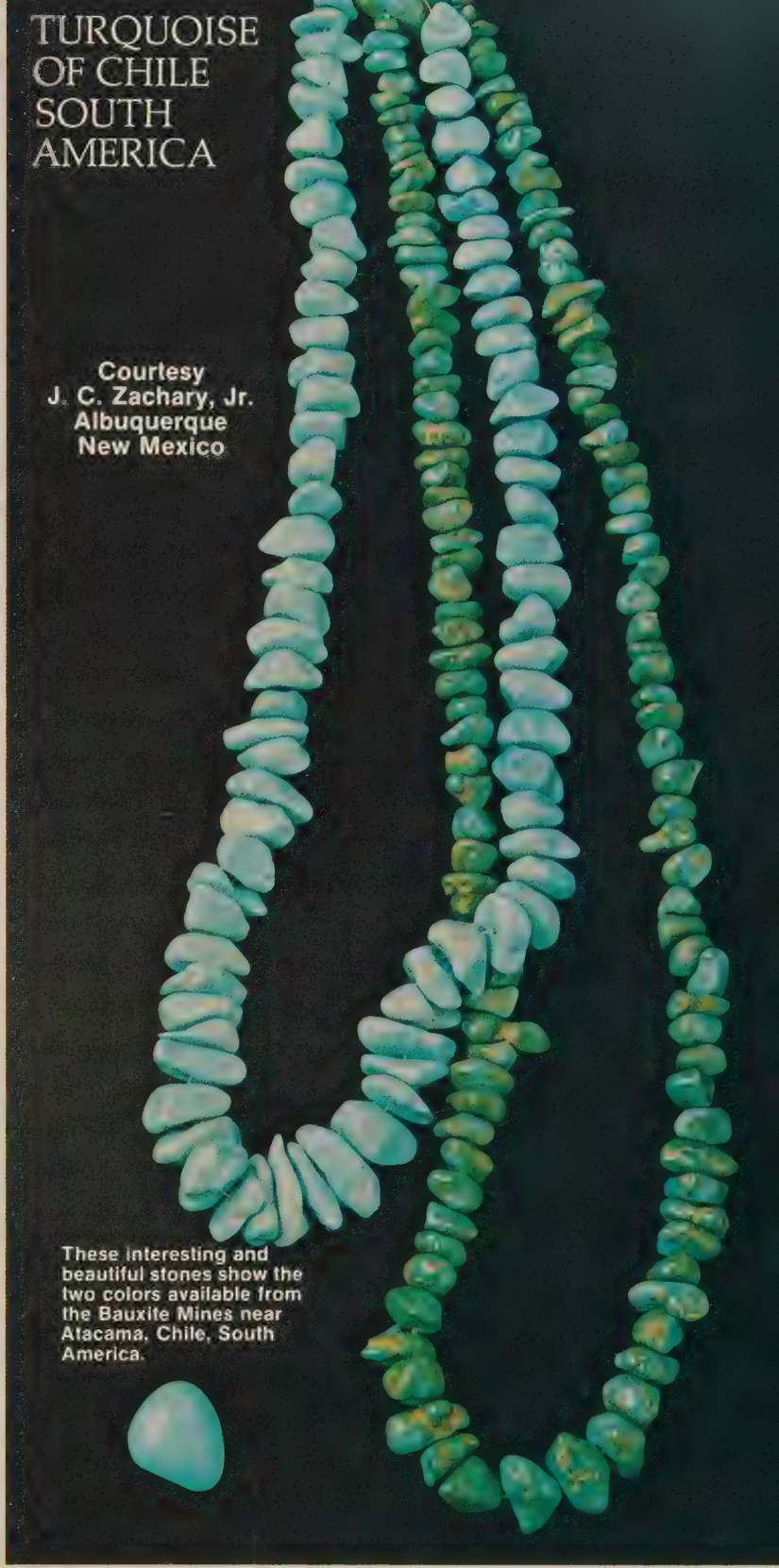
TURQUOISE OF MEXICO

Courtesy
Jim Godber
Scottsdale, Arizona

Courtesy
J. C. Zachary, Jr.
Albuquerque
New Mexico

Turquoise has been found in several localities in Mexico in modern times. In the states of Zacatecas, Sonora and the northern part of Baja California. These stones, from several mines near El Rosario, show a great color variation and interesting matrix patterns. Small quantities of this turquoise is available from time to time.

TURQUOISE OF CHILE SOUTH AMERICA



Courtesy
J. C. Zachary, Jr.
Albuquerque
New Mexico

These interesting and beautiful stones show the two colors available from the Bauxite Mines near Atacama, Chile, South America.

TURQUOISE OF AUSTRALIA

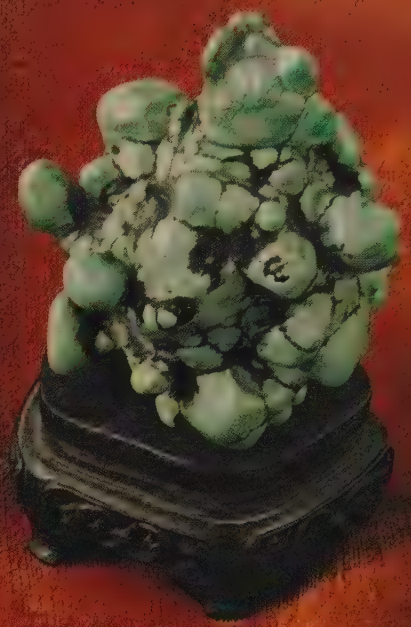
The turquoise from Australia has a very attractive spider web pattern. It is a light blue, not very hard, and very fragile. There are a number of occurrences in Australia but none of much commercial value.

Persian stones have been the standard of quality for turquoise the world over for centuries. There is equally fine turquoise found in the United States and many parts of the world but probably not in such quantities as in Persia. The Persians value most a stone without matrix of a fine blue color. Stones of this quality sell for hundreds of dollars a carat. The stones shown above are all hard, natural, and untreated, purchased by the author in Persia and made into jewelry in the Southwestern United States. The turquoise in the beads was mined in Persia and sent to Germany, cut and drilled, and returned to Persia.

Courtesy The Treasure Chest, Santa Fe, New Mexico

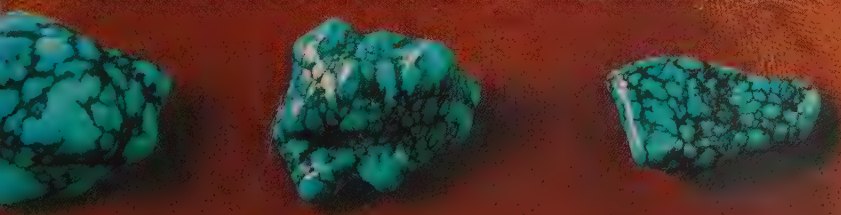
TURQUOISE OF CHINA

High quality natural
Chinese spider web turquoise
nugget necklace.



Snuff bottle of greenish turquoise carved to emphasize the nodular makeup of the stone.

urquoise
found in several
ocalities in China and
as been mined since ancient times. The color ranges from very dark
lue through light blue into green, even chalky greens and blues. Most
the material has a brown to very black veining or matrix resulting
an attractive large spider web. Chinese turquoise has a very
haracteristic color tone and together with the unusual matrix
attern, it can be easily identified. The turquoise occurs in size from
nall nuggets to quite large compact masses suitable for carving.
he small nuggets and fragments are cut into "finger bone" shapes
hich are also characteristic of most Chinese nugget necklaces. The



Lower quality
nugget necklaces

cheaper ones are usually oiled. In the Orient, there are many large and beautiful turquoise carvings available—usually figurines and vases.

ourtesy The Treasure Chest, Santa Fe, New Mexico

TURQUOISE OF TIBET

A pair of women's earrings, usually fastened to a cap rather than solely to the ears.

Earrings worn by both men and women

Courtesy
The Treasure Chest
Santa Fe, New Mexico

Turquoise pendant with image of Buddha carved in coral.

Turquoise is the favorite gem stone of the people of Tibet. It is to the Tibetans what jade is to the Chinese. Almost every person in Tibet possesses some turquoise. The Tibetans attach special powers to it and look upon it as a thing in itself and not as a stone. They not only wear rings and bracelets set with it and necklaces made of it, but are reminded every day by someone of its power of good fortune. The women's hats and head coverings are studded with it. They sew beads of it as a border along with coral on their clothing. Their horses and animals are decorated with necklaces of it sewn on felt. The author was told by the Tibetans that there is no turquoise mining in Tibet. It is all picked up from the surface because it is against their beliefs to scar or deface the earth. Judging from the tremendous amount of turquoise worn and used in Tibet, this would seem hardly possible unless there are extensive deposits weathering out over a very large area. Also, only occasionally does one see a stone from Persia or China mixed with the Tibetan stones.

TURQUOISE OF TIBET

This turquoise incrusted box of silver and gilt is used to carry prayers written on cloth or rice paper. It is usually worn around the neck as a pendant.

The turquoise is from Dergeh, Tibet and the coral is from the Coral Sea, traded by the Chinese into Tibet. Some of this coral in Tibet is very old and valued very highly. A fine bead, if broken, is repaired with brass pins. The bottom red bead on the left side shows three of these pins.

A large earring that has been made into a pin. 6 inches long.

Turquoise mounted in silver as a bead. Seven of these are usually strung and used as a hair ornament.

There are at least four places where turquoise is found in Tibet, and they are all great distances apart. The turquoise in the necklaces above was purchased by the author from a refugee Lama who got them near his home in Durgeh, Kam Province. Some of the other turquoise shown here was said to come from Amdo. The colors range from a deep sky blue through almost every possible shade of green and blue. Some completely flawless fine blue stones are seen but most have a very black matrix tending toward a spider webbing. Many of the Tibetan stones have a spider web matrix of a design unequaled anywhere else. The turquoise from Tibet has a certain characteristic all its own. Possibly it is the human influence and the skin oil that gives it a live, intriguing look. In Tibet it is loved and caressed and worn with affection, pride and dignity.

THE TRADITIONAL NAVAJO NECKLACE

This type necklace has been called the traditional Navajo necklace although it was made and worn first by the Pueblo Indians. Actually, it is worn by all the Indians of the Southwest.

The traditional necklace has been very popular with the Navajo for a long time. It is shown being worn by both men and women in the earliest pictures taken of Indians in the Southwest. This type necklace is seldom made by the Navajo. It has long been the most important trade item, together with the Jaclas, with the Pueblo Indians of the Rio Grande Valley. The "sing" is a separate bead or beads of shell or turquoise tied onto a necklace, usually by a medicine man, at a "sing" or ceremony, to bring good luck or help effect a cure.

This outstanding turquoise necklace belonged to Chee Dodge, leader of the Navajo people and Tribal Council Chairman for many years. It was carved by Leekya, famous Zuni Indian carver who used the natural contours of the stones to bring out their beauty. The leaf pendant at the bottom is over three inches long. The turquoise is from several localities.

Permission of Anne Waunekа, daughter of Chee Dodge.

THE SPONDYLUS SHELL

Also called Thorny Oyster or Spiny Oyster

An example of a beautiful spondylus shell with the spines or thorns intact.

The inside of a spondylus shell.

A Pre-Columbian spondylus shell bead necklace from an Inca or Chileche grave in Peru, about 700 years old. Private collection.

A Pueblo Indian ceremonial necklace made up of spondylus beads and pendants with turquoise.

A mosaic shell pendant on a coral necklace. The coral gained its popularity with the Indians in America after the advent of the Spanish. This was because of its similarity to the spondylus shell. There is no red coral found along the coasts of the Americas.

Two mosaic shell pendants. They are worn in ceremonial Indian dances.

The red spondylus shell or fragments and pieces of it has been a constant companion of turquoise in the Americas since early times. Wherever turquoise is found in archeological excavations, you will almost always find some pieces or beads of the Thorny Oyster. There were well established trade routes during prehistoric times between the Southwest and the Gulf of California, where the shells were obtained. These trade routes have long been abandoned, but the interest and demand for the shells still exists and a few still find their way into the hands of the Indians.

Courtesy The Treasure Chest
Santa Fe, New Mexico

A NOTE TO THE READER

In this book, the emphasis has been placed on the turquoise itself rather than on the jewelry. Therefore, jewelry of simple design has been chosen to show the turquoise to its best advantage and to display a maximum amount of turquoise. There are a number of one-of-a-kind museum pieces shown, however we have tried to show articles of jewelry with high-quality turquoise that are available in the better shops today. The turquoise illustrated in this book is genuine, natural and untreated unless so stated. There has been such a big demand for turquoise, the supply has not been able to satisfy the demand. This has created a problem. Someone discovered that soft, light colored turquoise soaked in a liquid plastic would produce a material of deeper color when the plastic hardened, somewhat like the better grade of turquoise. This was nothing new as it was done with animal fat and tallow thousands of years ago, not with the plastic permanance, but with the same effect. The words treated and stabilized are synonymous. They describe the same type process, and there are several, for impregnating soft porous turquoise with liquid plastic and hardening or stabilizing it. The treating of turquoise is not to be condemned and it is not wrong to buy or sell it; but it is wrong to misrepresent it or to mislead people. It should be sold as treated or stabilized and should hold the status and value of costume jewelry and not that of a true gemstone. Treated turquoise is produced with the inferior and unusable, if not treated, portion of the turquoise that is mined. This is possibly 80 percent of all turquoise mined. Therefore, since the process is not an expensive one, this type of turquoise should not command prices anywhere near those for genuine, untampered-with gems. Treated turquoise should be considered a substitute for the natural material and should be worn as such until jewelry with finer natural turquoise is obtainable. It is human nature to want to own and enjoy something genuine and natural.

ACKNOWLEDGEMENTS

A book of this sort can never be considered a one-man accomplishment. On every hand we have been given the most friendly and generous help and cooperation. I would like to acknowledge and thank the many people who have given us invaluable help and encouragement while we were working on this book. Especially their trust in loaning us their private and cherished possessions while they were being photographed.

I would like to give special thanks to my friend J. C. "Zack" Zachary, Jr. of Albuquerque, New Mexico, for his invaluable help in sharing his great knowledge of turquoise and his generosity in making gifts and loans of turquoise and turquoise jewelry unobtainable anywhere else.

I would like to show special appreciation to:

Polly Bircher, Albuquerque, New Mexico
Hollie M. Chaffee, Arizona State Museum, Tucson, Arizona
Bill Hagberg, Gallup, New Mexico

Thanks is also extended to the following people who are not mentioned elsewhere in the book.

Mark Bahti
Peggy Bahti
Mack Baulch
Mrs. Loretta Begay
Rex Bollin
Dr. and Mrs. Charles Brighton
James Cree
Gertrude Dial
Norris Elsing Collection
Max Evans
Clifford Gibson
Don R. Green
Helen M. Greene
Richard and Nancy Humphries
Henry Lyons
Greg Mardirosian
John Martin
Don Moore
Dr. and Mrs. L. F. Radmacher
Crockett Riley
J. W. Roberts
John Sinkankas
Mr. and Mrs. Nelson O. Smith
Mrs. Deyoe Stark
Dr. and Mrs. Hershel Thornburg
Bob Williams
Clyde Wright

My thanks also to many other people who have given help, advice or direction, and to anyone who has been unintentionally omitted.

The Zuni Indians of New Mexico love to display great quantities of turquoise on their person. This exceptionally large necklace and bracelet represent an extreme effort as a wearable display of their wealth. They are composed of 415 beautifully matched Lone Mountain turquoise stones. Each stone is cut for its particular place after the silverwork is done. The excellent design, the fine workmanship and the high quality of the turquoise make this an outstanding example of Zuni art.

Courtesy Treasure Chest, Santa Fe, New Mexico.